
	Experimental Report 	提出日 Date of Report
		2013.06.01.
実験装置名／BL番号 Name of Instrument/BL02 (2012I0002)		
Biomolecular Dynamics Spectrometer (DNA)/BL-02		
実験装置責任者 Name of the person responsible for the instrument:		
Nobuaki Takahashi		
所属 Affiliation: Japan Atomic Energy Agency		

1. 研究成果概要 (a)装置グループ内の成果、(b)ユーザー課題実装時における特筆すべきサポート、(c)ユーザー課題の執行状況について、まとめてください。A4 サイズ用紙使用のこと。

Outline of your activities. Following results at your instrument should be reported in A4 size papers: (a) results of your instrument group, (b) significant user support works, and (c) statistical summary of user experiments.

(a)The results of BL02 instrument group

The instrument group are permitted only commissioning experiment to confirm the development and the improvement of the spectrometer, Therefore, we report of commissioning experiments.

Until the end of January 2012, It is completed the setting of the main device on DNA spectrometer. Then, from February 2012, we started on beam commissioning experiments.

Of April 2012, pulse shaping chopper has not been installed. Therefore, using the pulse shape from the coupled moderator, it was operated as Si111 crystal analyzer spectrometer. Energy resolution $\Delta E=14 \mu\text{eV}$, and energy measurement range $-500. < E/ \mu\text{eV} < +1500$.

It was evaluated the alignment of the Si111 plane crystal analyzer 10 units initially installed. It was done the re-installation of 10 analyzer units on the basis of the evaluation results.

The performance evaluation of inelastic detector was carried out. According to check the trouble problem when it has been occurred at assembled, it was carried out the correction of setting parameters for the inelastic detector banks.

About diffraction detector, it was carried out adjustment and performance evaluation for two banks.

Corresponding to the enhancement of the proton beam output, the enhancement of beam stopper and shield at the entrance section of scattering vacuum chamber was performed.

It was evaluated the performance of the three low-speed chopper, and it was determined the optimal parameters.

Of October 2012, the No.1 pulse shaping chopper has been installed with one disk A. After this, we started the experiment using a pulse shaping beam. Energy resolution $\Delta E=3.0 \mu\text{eV}$, and energy measurement range $-40. < E/ \mu\text{eV} < +100$. We were successful in the measurement of tunneling spectrum for methyl group rotational motion in 4-Methylpyridine N-oxide powder. At the same time, it was found to be that can measure with very low background, $S/N > \sim 100000$.

(b) The significant user support works on BL02

We have started the public proposal experiment in May 2012.

1. 研究成果概要(つづき) Outline of experimental results (continued).

The sample environment apparatus (top loading furnace cryostat for BL02) was performed adjustment. (Expanding the temperature range: 3.5K ~ 700K)

During the measurement of a public proposal 2012B0014, the brought in sample ${}^7\text{LiCo}_{0.5}\text{O}_2$ had caused an abrupt thermal decomposition (That is an explosion). Because of this explosion, Al sample container damaged and the inside of cryostat was contaminated by sample powder. Because of this accident, the experimental time had been lost for about 1 week.

(c) statistical summary of user experiments.

[2012A]

[BL-02] approved public proposal (DNA)

No.	Title of experiment	Principal investigator	Affiliation	Beamline	Selection Committee		Carried out days	Implementation rate %
					Beamtime (days)	Recommendation		
2012A0003	Dynamics-structure relationship in the amyloid fibril formation studied by neutron scattering	Satoru Fujiwara	Japan Atomic Energy Agency Quantum Beam Science Directorate (Tokai)	BL-02	6.0	Approved	6.0	100
2012A0037	Dynamics of surface condensed water in nano-porous silicate.	Takeshi Yamada	Research Center for Neutron Science and Technology (CROSS) Tokai	BL-02	6.0	Approved	6.0	100
SUM					12.0		12.0	100

[BL-02] Project proposal (DNA)

2012P0402	ソフトマター中の水のダイナミクス (A: リン脂質膜間の水のダイナミクス, B: ハイドロゲル中の水のダイナミクス)	Nobuaki Takahashi	J-PARC Center		2.0		2.0	100
2012P0502	中性子非弾性散乱による蛋白質および蛋白質複合体のダイナミクスの解析	Satoshi Fujiwara	Japan Atomic Energy Agency		6.0		0.0	0
2012P0901	BL02ダイナミクス解析装置を用いたプロトン・イオン機能性物質の構造とダイナミクスに関するプロジェクト研究	Yukinobu Kawakita	Japan Atomic Energy Agency/J-PARC Center		8.0		6.0	75
SUM					16.0		8.0	50

[BL-02] CROSS development proposal (DNA)

2012I0102	高圧状態を含むガスおよび液体雰囲気試料環境装置の開発	Kaoru Shibata	Comprehensive Research Organization for Science and Society		6.0		4.0	67
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[2012B]

[BL-02] approved public proposal (DNA)

No.	Title of experiment	Principal investigator	Affiliation	Beamline	Selection Committee		Carried out days	Implementation rate %
					Beamtime(Days)	Recommendation		
2012B0136	Dynamics of the muscle thin filaments studied by neutron scattering	Satoru Fujiwara	Japan Atomic Energy Agency	BL-02	7.0	Approved	7.0	100
2012B0254	Dynamics of water confined in ordered mesoporous carbon	Toshio Yamaguchi	Fukuoka University Department of Chemistry	BL-02	4.0	Approved	4.0	100
2012B0137	Dynamics-structure relationship in the amyloid fibril formation studied by neutron scattering	Satoru Fujiwara	Japan Atomic Energy Agency Quantum Beam Science Directorate (Tokai)	BL-02	7.0	Approved	7.0	100
2012B0047	Correlation between gas permeability and local dynamics of poly (4-methyl-1-pentene)	Rintaro Inoue	Kyoto University Institute for Chemical Research	BL-02	6.0	Approved	6.0	100
2012B0099	Dynamics of Polymer Chain in Confined Space of Micro-phase Separated Structure Formed by Amphiphilic Liquid	Takeshi Yamada	Research Center for Neutron Science and Technology (CROSS) Tokai	BL-02	4.0	Approved	4.0	100
2012B0014	Interrelationship between quantity/speed of Li self-diffusion and mixed-valence state of Cobalt ion of $\text{LiCo}_{1-x}\text{MgxO}_2$.	Kazuya Kamazawa	Research Center for Neutron Science and Technology (CROSS) Tokai	BL-02	5.0	Approved Sample explosion trouble	0.0	0
SUM					33.0		28.0	85

[BL-02] trial use proposal (DNA)

2012B0023	Na diffusive analysis for Na_xCoO_2 ($x=0.5-0.75$) using neutron quasi-elastic scattering technique	Nozaki Hiroshi	株式会社豊田中央研究所	BL-02	4.0	Approved	4.0	100
2012B0059	Dynamics of water in methyl cellulose hydrogels by quasi-elastic neutron scattering	Minoguchi Ayumi	富士フイルム 株式会社	BL-02	2.5	Reserved	2.5	100

[BL-02] Project proposal (DNA)

2012P0402	ソフトマター中の水のダイナミクス (A: リン脂質膜間の水のダイナミクス, B: ハイドロゲル中の水のダイナミクス)	Nobuaki Takahashi	J-PARC Center		7.0		7.0	100
2012P0502	中性子非弾性散乱による蛋白質および蛋白質複合体のダイナミクスの解析	Satoshi Fujiwara	Japan Atomic Energy Agency		7.0		7.0	100
2012P0901	BL02ダイナミクス解析装置を用いたプロトン・イオン機能性物質の構造とダイナミクスに関するプロジェクト研究	Yukinobu Kawakita	Japan Atomic Energy Agency/J-PARC Center		0.0		0.0	100
SUM					14.0		14.0	100

[BL-02] CROSS development proposal (DNA)

2012I0102	高圧状態を含むガスおよび液体雰囲気試料環境装置の開発	Kaoru Shibata	Comprehensive Research Organization for Science and Society		6.0		0.0	0
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必要に応じて、A4 サイズの用紙に続きを記入して下さい。

Please use A4-size papers for further reporting, if necessary.